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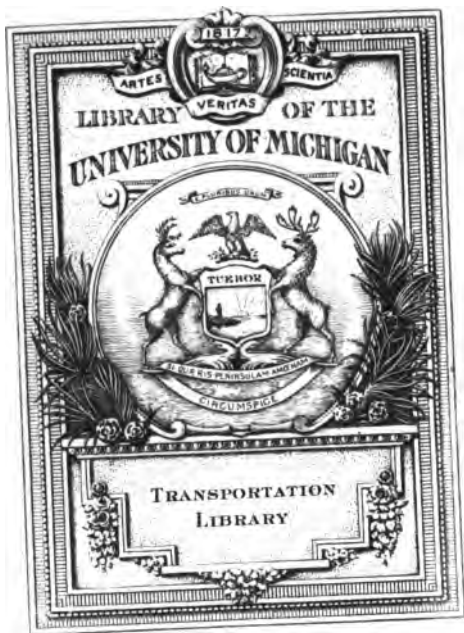
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DR. NEESEN'S
BOOK ON WHEELING

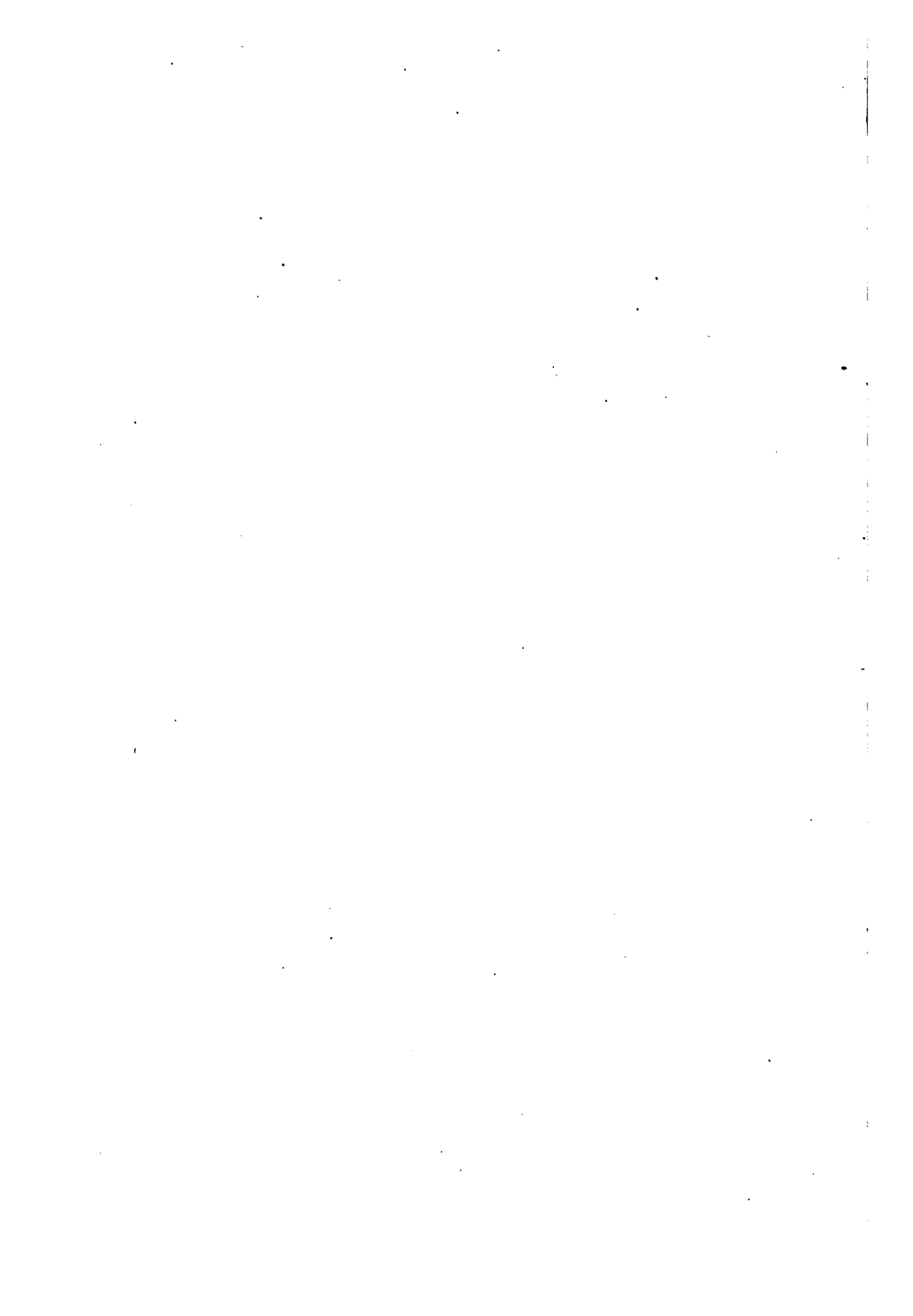






PHOTO BY BUTLER

Combination Tandem—Showing Divided Skirt in contrast to Luey Skirt—Divided Skirt unnecessarily short

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DR. NEESEN'S BOOK ON WHEELING

Hints and Advice to Men and Women from
the Physician's Standpoint.

BY
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Illustrations and Appendix.



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DEDICATION

To that vast army of male and female bicyclists who have
arraigned themselves against our common enemy "Ill
health" this book is dedicated with the hope that, if
they have health it may always continue, and if
they have it not, it may speedily be theirs.

Health of the rosy, romping, rollick-
ing kind, with its accompani-
ment of jubilant and
sparkling spirits.



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PREFACE.

I HAVE recently met with several cases of sickness produced by bicycle riding. And I have recently read a few magazine articles on the dangers of bicycling. And I have all along, ever since wheeling became popular, observed so many people of both sexes who did not derive benefit from their exercise, because of a lack of knowledge of the correct method of riding, that I am constrained to take up my pen, with much diffidence, and endeavor to show those who do not ride properly wherein lies their fault ; to explain to those who suffer bad effects from wheeling how to pursue this captivating sport with profit to their health ; and to satisfy those who have eschewed the pleasure which all their friends are enjoying, because of the doubt whether it is good for them, —that wheeling, when properly indulged, is the grandest institution of the nineteenth century.

INTRODUCTORY.

BICYCLING CONSIDERED AS AN EXERCISE.

MEDICAL authorities, with few exceptions, agree that bicycling is an excellent form of exercise. Some claim that it is general in its effects, others that certain parts of the body only are developed, and the "exceptions" hold that it is detrimental to the health *in toto* and ought never to be indulged, except after consultation with a physician. Of course it all depends on the point of view. Each one is right in a way. It is a general exercise if followed in the proper manner. It is a special exercise if pursued in the wrong way. It is distinctly detrimental to those who have certain physical defects, who assume hurtful positions, or who injudiciously ignore the limit of their physical powers.

Few of its advocates have taken the trouble to explain how or why it is a general exercise. The reason may possibly lie in the fact that most people find it out for themselves when they learn to

ride. After a few rides the novice finds that his muscles are aching all over his body from his neck to his ankles. And if he has been foolish enough to have undertaken a long ride at first he will find that the slightest movement of his trunk will cause him pain. But the argument is raised that after the initial stages the development of the muscles above the waist ceases; thenceforth the legs and thighs only are involved, and of these only the extensor muscles do the work.

It is necessary carefully to disprove this argument; for to reject it without consideration is to brand oneself an unreasoning enthusiast. It is true that bicycling is not a perfect all-round exercise. There is no one exercise in existence that is perfect. Swimming comes nearest to perfection and I consider bicycling comes next. The lower extremities are certainly exercised the most in bicycling as they are also in swimming. If the upright position is assumed in cycling, the muscles of the back are not used any more than in walking. But if the correct position—i. e. the inclined position—which is described in the first chapter is maintained, the muscles of the back are used pretty much as they are in swimming. A person in this position constantly exercises most of the muscles of the whole body. The

forward inclination of the body necessitates erection of the head by the muscles at the back of the neck. The back is kept perfectly straight by the muscles of the back. The weight of the thorax is supported partly by the arms (muscles of shoulders). The arms are kept straight by the extensor muscles of the arms. In climbing hills slight traction is made on the handle bars (flexor muscles of arms). The accelerated breathing necessitates increased use of chest and abdomen (muscles of respiration). The downward push of pedals brings into play the extensor muscles of thigh and leg. The backward push of pedals exerts the muscles of calf of leg and ankle. The return of leg to flexed position calls into action the flexor muscles of thigh and leg.

By this summary it will be seen that practically the only muscles left out are the swinging muscles of the arms. So much for the complete refutation of the charge that wheeling develops only one set of muscles.

Of the effect of wheeling on the general health the following pages will treat. Suffice it to say here that an ordinarily healthy individual who takes to wheeling with a desire to do it properly and in moderation will find his health improve as the legitimate sequence of fresh air in his lungs,

stimulation to his nervous system, acceleration of his circulation, improved nutrition to his organs, and the perfect elimination of those waste products of combustion which, if retained, facilitate the entrance of disease.

WHEELING.

I. HYGIENE.

Fashion has declared wheeling to be “au fait”; physicians have asserted that it is healthful; proper mounting and correct costume have made it becoming, and nothing now remains to deter one from indulging in this exhilarating pastime but the price—and that is rapidly arriving at a sum within the means of every one. If you have abstained thus far from mounting the silent steed and following your friends and neighbors along the smooth roads and sunny paths of the suburbs, or the picturesque highways of the country, we will suppose that all your doubts have been removed and you have decided to learn to ride.

The first thing in order is to secure your wheel, and a few hints relative to its selection have been vouchsafed in the appendix to this volume:

Having purchased your wheel you will be next concerned about your costume. Many changes have been wrought in costumes since bicycling first came into favor. The present regulation costume is the outgrowth of many experiments, and is the most serviceable and becoming that could be created. It consists of a French flannel shirt with a flowing tie ; knickerbocker breeches called bloomers, terminating in a wide band which buckles just beneath the knee, and held up by a leathern belt at the waist ; stockings of the Golf type—a plaid with a turnover at the calf ; low shoes of black or tan ; a short jacket of the English smoking style ; and a cap with a peak, made of any soft stuff, preferably of the same goods as the suit.

The next thing is to adjust your wheel to your person, so that your position may be correct, and so render the task of learning to ride easier. Full directions on this subject are given in the appendix, under the heading "How to Select a Wheel."

The position the rider assumes on his wheel is of vast importance in many respects. His health, his endurance, his control of the wheel, his power of propulsion, his speed, are all dependent upon his position in the saddle. Of such vital impor-





PHOTO BY BUTLER

Racing Position—"Bicycle Face"

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tance is this mooted subject, that a great many articles relative to it have found their way into print. Authorities on health and authorities on wheeling have each had their say, and the public is left to choose for itself.

There are three distinct positions recognized : viz., the "upright," the "inclined," and the "scorcher's." All the authorities unite in condemning the scorcher's position, except for racer's use. Then opinion is divided between the other two. It is regrettable that most of the medical men have favored the upright position and have strongly condemned the inclined position as little better than the scorcher's. On the other hand, practical bicyclists and a few physicians who have studied the subject, affirm that the inclined position is the only correct one. It may be all right in theory to "sit up straight," but sitting in a bicycle and sitting in a chair are two separate and distinct things, and are incomparable. When I range myself with the practical bicyclists and firmly assert that the only correct position is the inclined one, I am fully aware that I have much weighted opinion against me and I will have to prove my assertion.

I will first consider the upright position and endeavor to show how it is faulty. We will take

any rider at random, on the boulevard, who affects the upright position and analyze his movement. His handle bars are curved up instead of down, his elbows slightly bent, and his arms support none of his body weight. His saddle is well back over the rear wheel and he sits quite upright. All the weight of his body is in his saddle, and of course that must be very comfortable or he will be sore after riding a short distance in it. His pedals are so far in advance of his seat that his leg to the knee is perpendicular and follows the pedal up and down like a pump-handle. The sole power of propulsion is the muscular exertion of the thigh and hip. The weight of the body instead of being a help is a hindrance—a dead weight. Now watch this rider go up a hill, and you will see him go slower and slower, and puff and blow and pull on his handle-bars, as though he were pulling himself up by his hands.

The disadvantages of the upright position are more apparent in women than in men. As a rule a woman is liable to have her saddle too low as well as too far back, which makes the knee-action more pronounced. Then her handle bars are more likely to be curled up and she probably rides too high a gear. When she attempts the hill it will be a repetition of the old story—she



PHOTO BY BUTLER

Upright Position (male)—High Handle Bars

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PHOTO BY BUTLER

Correct Position—Diamond Frame Wheel—Ram's Horn Handle Bars
—Page 17.

will get very red in the face and finally dismount and walk up.

Now, for a consideration of the inclined position and its advantages. We will suppose that your wheel is properly adjusted: that is, that your frame and crank bar are of suitable length, that the rear edge of your saddle is about twelve inches back of a plumb line dropped through the crank hanger, and that the handle bar curves slightly down, leaving the cork handles a half inch below the level of the seat. If your wheel is so adjusted you will naturally assume the correct position. Your back will form an angle of sixty degrees with the horizon. The back is kept perfectly straight from the neck to the hips and the head is slightly extended. The arms are also kept perfectly straight, for they support about twenty per cent. of the body weight when the wheel is at a stand-still. The hands should not be too far apart but come straight down from the shoulder. The ball of the foot only should be placed on the pedal and the heel slightly raised. The knees are kept in close to the machine.

When you have once ridden in this position you will appreciate its advantages. Briefly stated they are as follows:—The center of gravity of the body weight is directly over the crank wheel, where

it belongs. Several objects are thus effected. The weight is equally distributed between the two wheels ; the power of the weight is added to the power of the muscular action, for the rider is directly over his work, and his weight can be concentrated over either pedal ; the body weight being distributed between the three points, saddle, handle bar and pedal, there is less danger of a blow to his perineum, in going over a bump, for he can rise in his stirrups, as it were, which he could not do in the upright position. The wheel is more easily controlled when there is some weight on the handle bar ; its head is not so free, to use a turf expression. It is more easily mounted and, in case of a fall, the rider can more quickly and safely jump from the machine. And incredible as it may seem, there is less tendency to back-ache from the inclined position than from the upright. The element of lessened resistance to the wind might be considered another advantage of the inclined position.

The objection to this position usually advanced by physicians, that the chest is cramped and the lungs compressed, has no foundation in fact. The back is not humped : it is held perfectly straight. The shoulders are not rounded : if anything they are pushed back. Then the head is

extended, which gives the chest even further liberty. The muscles at the back of the neck are constantly used, exerting a corrective influence to any stooping tendencies of the individual. In fact physical culturists place great importance on the development of the neck muscles when they desire to correct forward drooping of the head, familiarly known as student's droop.

Two objections to this position are voiced by the female contingent. "The weight on the arm," says one; "I know my arms could never stand it." Which may be dismissed with one sentence. The weight is only felt by the arms at a stand-still or very slow pace. When the pace gets to be six or seven miles an hour, the weight is transferred to the pedals, for it is needed for the work to be done.

"But I am sure I would not look well that way. It is ungraceful." Which depends upon the point of view. Custom and habit are responsible for a good many of our ideas of grace, style, and propriety. Once let the inclined position come into general vogue and you will wonder how you ever permitted yourself to ride through the street in the old awkward way.

Learning to ride is not such a "bête noir," if you are properly coached. The best way is to at-

tend some good instruction school where in a few lessons you will learn enough to finish by yourself. Some of the bicycle manufacturing firms have established riding academies where instruction is given free to purchasers of their wheel. If, however, you are so situated that you cannot attend one of these schools, the next best thing is to secure the services of a strong, patient friend and go to a smooth, unfrequented road, and with a firm determination to persevere until you succeed, start in.

The first thing to be learned is the art of falling. No matter how long you wheel, there is always the chance of a tumble, and if you know how to fall properly, you may save yourself some bruises and perhaps cuts or fractures. When you are sure you are going to fall, and not before, for you can often save yourself by clever manipulation of the steering apparatus, then abandon the wheel and save yourself. A wheel is less likely to become injured in falling by itself, than in your falling upon it. Let go of the handle bars, take your feet off of the pedals, stick out the foot of the side to which you are falling, and curl up the other. You will then clear your wheel and land on your feet.

Balancing one's self on the wheel is thought by

beginners to be the first essential. They are entirely wrong. The body should not be swayed from side to side to preserve the balance. When the right position is assumed, the body from the hip up should be held perfectly still ; the balancing is done by steering the front wheel to the side toward which you are falling.

If you have the assistance of a friend, you will not have to learn how to mount first. Otherwise you will. In learning to mount, head your wheel for the down grade, place your left foot on the little projection on the rear axle, shove off with the right foot, raise up on your left foot, and balance that way until the right pedal rises to its height, then place the right foot on it, glide into the saddle and seek the left pedal with the left foot. Experts are in the habit of mounting directly from the pedal as a horse is mounted. This requires considerable skill. Dismounting, however, is done from the pedal. Just as the pedal reaches its lowest level, and is about to rise, stand up on it and fling the other leg over the saddle. Mounting from the pedal is done in the same manner.

If your friend is with you let him hold the wheel steady while you mount it. Then all he has to do is to run by your side, maintaining a

firm grip on your saddle to prevent you from falling. It is not necessary for him to touch your body or clothing at all ; far better not to. As soon as you feel you have confidence enough to go it alone, do so ; the sooner the better.

When you have once mastered the machine, like any other trick you will never forget how to do it. While you are learning it would be an excellent plan to practice gymnastics or calisthenics at the same time. One reason why wheeling is injurious to some is that it is attempted by people wholly unfit for any kind of exertion. Women who are in the habit of sitting around, sewing or novel-reading, will suddenly, on a bright day, take a long ride on their wheel, without any preparation for it whatever. Small wonder then if it is disastrous.

After you have learned to ride, then you can begin to pay some attention to how to ride properly. The correct rider moves only his lower extremities, which move up and down with machine-like regularity. His body above the hips, his head and arms are perfectly still and straight. The ball of the foot is on the pedal and the knees are close together. As the foot is pushed down, the heel is slightly raised. This produces the ankle motion so often lost sight of. The wheel is

so adjusted that when the pedal reaches its lowest point, the leg is not straight, but slightly bent. The best results are not obtained when the leg can be fully extended, and ankle work is lost.

Hill climbing is the best test of a rider's style. Muscular power does not count so much as one would suppose. It is a common sight to see a small boy go up a hill faster than a man. In hill climbing the ankle movement is called prominently into requisition. It is thus described: Just as the pedal reaches the top, lower the heel and push forward, then downward, and as the pedal nears the bottom, raise the heel and push backward. Toe clips are of inestimable service both in ascending and descending hills. They prevent the foot from slipping off the pedal and thus losing control of the machine. At the beginning of a short hill, spurt a little to get up as far as possible before settling down to hard work. Then bend a little more forward over the wheel so as to concentrate the weight over the pedals and play the ankle movement, and you are all right.

A change of position often becomes absolutely necessary to relieve the strain incident to maintaining one position for any length of time. It is well to have handle bars that curve slightly

downward and backward, for they will then afford two positions for the hands: the ordinary one on the handles and a forward one on the center. It is well also to learn to ride with one hand and without hands, as in this way a number of positions can be assumed with relief to the rider.

Never ride with the head down, as you do not see where you are going and a serious accident may occur. Always ring your bell when you are about to pass another rider, and always pass to his left. The general rule of the road to keep to the right is an excellent one; there is some system about it and others are enabled to pass you. Always ring your bell before turning corners, and when turning around in the road look behind you before you do so. Be careful of sand and wet or muddy pavements. In going over them give the wheel its head in sand and hold it rigid on wet pavements.

In taking the first few rides do not attempt too great a distance. Going to nowhere and back is dull, I am aware, but going to somewhere, several miles farther on, may overtax the endurance and discomfort will be the result.

A few words might appropriately be said at this point concerning tandem riding. Nothing is more enjoyable when both riders are good



PHOTO BY BUTLER

Combination Tandem.—The Positions here are correct with the exception of the woman's arms which are bent too much on account of faulty handle bar adjustment

—Page 24.



bicyclists and know each other's stroke. The perfect rhythm, the added power and increased pace, the greater endurance, make it very attractive to most people. But do not be disappointed if your first ride is not as enjoyable as you anticipated. You will have to ride with the same person several times before you get accustomed to each other's peculiarities, and so adapt your power with your stroke so that they will be uniform. To ride with different people is of course folly, unless you do not care whether you do all of the work or not.

To breathe properly is probably the most important thing for the bicyclist to learn. Good wheeling depends as much on the knowledge of breathing as upon muscular strength. A philosopher has said that a horse runs with his legs but gallops with his lungs. It is certainly the fact that the record makers in bicycling have lungs of wonderful air capacity. But it is not essential to have big lungs if one knows how to use properly what one has.

Theoretically, the wheelman ought to breathe through his nose, but this is not always possible. Not to say anything about deformities, obstructions in the nasal passage, etc., the wheelman frequently becomes so excited in guiding his

wheel that he forgets entirely about his nose and breathes through his wide-open mouth. In the beginning the wheelman has enough to think about without keeping his mind on his style of breathing, and many think that breathing through the nose is simple enough and is done automatically, without any thought about it, and it is, after the habit is acquired. But if you do not take the trouble to practice nose-breathing, you will often surprise yourself breathing through your mouth, especially when your pace is fast. The injurious effects of a column of cold air coming in direct contact on the overheated and delicate tissues of the larynx, bronchial tubes and lung structure is recognized by all physicians. It is the frequent cause of any or all of these diseases, —Pharyngitis, Laryngitis, Bronchitis, Pneumonia, Inflammation of the Tongue, Tonsilitis, Toothache; and it predisposes to consumption in two ways:—by weakening the resisting powers of the lung tissue and by inhaling directly any germ that may be present in the air. The fear of contracting one or more of these troubles alone should induce the wheelman to practice nose-breathing.

The first condition of its success is to be sure the nasal canal is entirely free from obstructions. Many people have polypoid growths in their nose,

which they know nothing about. If such a thing is suspected, it would be well to have them removed by a nose specialist. If you have catarrh, or rhinitis, or cold in the head, they should be treated, for they are inimical to nose breathing. If the nasal mucous membrane is hyper-sensitive, you will have some trouble when the air is cold, for rapid riding necessitates rapid breathing, and the contact of the cold air induces a slight congestion and a free secretion, which is nature's protection to the membrane, and a frequent blowing of the nose is imperative. But when this becomes annoying, resort should not be had to mouth breathing, because the nose will get used to the cold air if persisted in. But if you breathe through the mouth for a while and then try to return to the nose, the same trouble will persist. Most people do not know how to use the muscles of their nose in breathing. They simply draw the air in, and if done slowly that is all that is necessary. But when you exert considerable muscular energy, whether in running or wheeling, or any other exercise, if you do not use the muscles of your nose, you will find that the nostrils collapse. You can try it at this moment;—take a sudden deep inspiration without using the nose muscles, and you will see the nostrils drawn in,

thus materially lessening the lumen of the canal. When this happens on the road, the rider is apt to open his mouth, for it is necessary for him to get more air into his lungs than his nose allows. This is precisely the point where a knowledge of nose breathing saves a man. If you watch a horse which has been driven hard, you will see his nose dilate at every inhalation. These muscles keep the nostrils apart, thereby allowing a maximum column of air to enter the posterior nares, there to be warmed and moistened before entering the lungs. The horse uses these muscles automatically because he has been brought up to running. The human being has to learn this trick.

If, however, at any time you are compelled to breathe through the mouth, another little trick is worth knowing. That is, to place the tip of the tongue behind the upper front teeth. The column of air is thus broken and strikes the under surface of the tongue first, which is copiously provided with large veins filled with warm venous blood and then circulates in the mouth before it is inhaled. If you put your tongue on the outside of your teeth, as is sometimes done, a sudden jolt may make you bite, it which is not very pleasant.

The claim that the inclined position makes proper breathing impossible by preventing the

complete expansion of the lungs has been proven to be false. The fact that the arms are brought forward close to the chest does not mean that they interfere with the lateral expansion of the chest. The ribs do not expand to any extent laterally. Their principal motion is up and down in their anterior aspect. The erection of the head and the straightness of the back rather help this movement than otherwise.

To keep your health in good order and receive the best nourishment from your food, you will want to know what to eat :—what foodstuffs contain the most nutriment ; how long it takes to digest them ; how soon you may ride after eating ; what you may safely drink and when.

One's strength comes from the food one eats. The greatest strength is undoubtedly produced by the most perfect assimilation of food. If you have a perfect digestive apparatus, you can eat anything, and your organs will separate the wheat from the chaff, assimilate the good, and throw off the bad. But if your digestion is not perfect, and few are, you will have to do some of the separating before the food enters your mouth.

It would be impossible to lay down any hard-and-fast rule which would fitly govern all people in the matter of food. “ What is one man's meat

is another's poison" applies nowhere more aptly than here. Each person is constituted differently. Unless you are in training, you will wisely follow your regular habits if they do not conflict with the following general rules.

Give your stomach time to digest the food you have put into it. From two to four hours are required to complete digestion, but of course wheeling is not tabooed all this time, or the wheelman would do naught else but eat and rest. But at least a half hour should intervene after a heavy meal before taking to the wheel. Digestion will then have had time to get well under way and will progress favorably if too hot a pace is not attempted. If you are on an excursion, or touring, and must take to the road right after eating, it would be well to remember those dishes which are hard to digest and avoid consuming them. A table of the time required to digest each of the common articles of food is appended.

The subject of drink is worth a deal of consideration. The cause of thirst, what best quenches it, what one should not drink, the opinion of the medical profession in regard to the fancy drinks, etc., are all questions which profoundly interest the bicyclist.

Thirst is the cry of nature for water with which

to dilute the blood. The method of its production is as follows : The water in the body is eliminated either through the kidneys, skin or lungs. When work or exercise or hot weather is severe enough to produce perspiration, an increased amount is excreted, and therefore, to maintain the balance, an added amount is required, and if not supplied, thirst is produced. In wheeling all the essentials are present : muscular exercise, free perspiration and rapid breathing. There is another element added in those who breathe through their mouth : the throat and mouth become parched by the cold dry air passing through them and resort to frequent drinking is imperative.

The only thing that will effectually quench thirst is water. Popular opinion to the contrary notwithstanding, all drinks are valuable as thirst-quenchers in proportion to the water they contain. Thirst is sometimes masked by the substitution of another sensation : bitterness, sourness, sweetness, etc., and a person may be fooled into thinking that a small quantity of a liquid containing lemon and sugar answers the same purpose as a larger quantity of pure water. It would not be safe to tell everybody to drink as much as they want, for some would surely commit very grievous error ; so that a few general rules may

be laid down. Never drink ice water or iced drinks. Never drink more than a swallow at a time when you are overheated ; wait until you are cooled off and then drink all you want of cool water. During a long ride, stop whenever you are thirsty and drink a few swallows of cool water ; ride very slowly after it for five minutes and then resume your regular pace. You will be surprised at your increased endurance if you observe this little trick.

The theory that warm drinks quench thirst better than cold ones is a warped one. If you feel warm you would not build a fire in your room and close the windows. The idea of taking warm drinks is to drive the blood into the interior of the body and so make the skin feel cooler, when nature is striving to do exactly the opposite—to send the blood to the surface where it can be cooled off.

The less coffee or tea a wheelman consumes, the better off he will be. Neither of them contains a bit of nourishment ; they are stimulating to the heart, and are consequently injurious to that organ.

As to liquors, whatever you do at other times, do not touch them while wheeling. Nothing requires a clear head, a steady hand and unshaken

nerves more than cycling. The same thing may be said about beer. It is soporific as well as intoxicating, and a common effect is a feeling of weakness after its use. If a bitter drink must be had, a little quassia or gentian left standing in a pitcher of water will impart a bitter flavor, having also a tonic effect.

Soda water and lemonade are not so good as plain water in many respects. In small quantity they do not satisfy, and one cannot drink much of them because they will produce stomach-ache, as well as bankruptcy. Vichy would be good if it were not for the gas—but in that event it would not be Vichy. Milk is a good drink in every way. It is nourishing, it quenches thirst, and it is agreeable to most everybody. The addition of a little lime-water makes it digestible to the most delicate stomach. Buttermilk is also excellent.

Of the different fancy drinks, iron tonics, blood-purifiers, magic strength-imparters, etc., it is necessary to say very little. Leave them alone, one and all, from A to Z. They are apt to do you more harm than good. It is true the effects of Kola and its class are increased strength, endurance, wind and general well-being, as long as you continue to take them in ever-increasing doses, but when you stop—what then? Collapse.

And it will take a long time for your system to recover from their pernicious influence.

If you require a drink that shall be strengthening as well as refreshing, you can take nothing better than a glass of cool water with a teaspoonful of Wyeth's Beef Juice in it. The nourishment in that will be equal in amount to what is contained in a half-pound of steak.

People do not generally understand that they breathe through their skin as well as through their lungs. When the skin is clean and the pores open, the blood is brought close to the surface, in the fine veins and capillaries, and carbon dioxide is given off and oxygen taken in to replenish the tissues. When on excursions a bath should be indulged in every morning before the start. At other times, a bath at the end of a ride is the most serviceable and refreshing. If a cold bath is taken, a good reaction of the skin should be induced by friction with a rough towel, or if that is not sufficient, with the hands.

Most people will not be foolhardy enough to plunge their head in a spring or tub of cold water, or hold their head under a pump, after they have been riding hard, and are very warm. But some will, and for the benefit of these, it is referred to. Such an act would cause such profound reaction

that cerebral congestion might result. It would certainly produce head-ache, dizziness, and perhaps vomiting in any person who was not strong as an ox.

Another thing to be warned against is going in bathing or swimming, in the ocean, too soon after a long hot ride. The system has hardly had time to recover from the tax of a hard ride before another strain is put upon it in the shape of battling the breakers.

The subject of training will interest only those who contemplate entering races. If you have decided to race, it is necessary to train, and the first thing to do is, to see your doctor, and find out whether you are physically sound and can stand exhausting work, for, if you have some physical defect in heart, lungs or kidneys, of which, of course, you knew nothing, they may be aggravated by training and result in permanent injury perhaps. You will then save yourself the disappointment of much self-denial for nothing, and avoid the risk of collapse after a race.

If you are physically sound it would be well to enter a gymnasium and consult the director or trainer. He will advise you what sort of exercise you need most to put you in good general condition. Light work, such as vaulting, running,

punching-bag and class work with light dumb bells, and Indian clubs, and light-weight chest machines is the best. The idea is not to produce muscle so much as a generally sound condition. Three or four weeks of this kind of work will fit you for the wheel and the road work. It would be well at this juncture to make out a daily plan, and follow it rigidly, for much depends on regularity and system ; a good schedule would be as follows : Arise at seven, take a cold bath, securing a good reaction by a Turkish towel ; breakfast at eight ; rest an hour and a half ; put on your sweater and mount your wheel for a run of ten miles at an even pace ; upon returning strip (in a warm room) and rub yourself dry with a Turkish towel and follow with hand massage. A little alcohol and witch-hazel, equal parts, is good to keep the muscles pliable. If possible have another person do the massage, as it can thus be done more thoroughly and seems to have a better effect. Have your dinner between twelve and one and rest at least two hours after it. Then take to the road again for another spin, which should not be as long as the morning ride. Upon returning, have yourself rubbed down, just as you did in the morning. Have your supper at six o'clock and go to bed at ten. A full night's

sleep, say of ten hours, is essential, for the recuperation of the vital forces. Your bill of fare should be constructed about as follows :

Breakfast :—Fruit, oatmeal, hominy or other cereal, broiled chops or steak, or eggs in any style, stale white bread, graham bread or toast, cocoa, or weak tea. Avoid : Fried foods, hashes, meat-pies, sausage, griddle-cakes, coffee, and strong tea.

Dinner :—Soup, oysters or clams, roast meats (except pork, veal, and corned beef), vegetables (plain cooked or fresh), very little potatoes, dessert (puddings or prepared fruits). Avoid : Gravy soups, pork, veal, corned beef or fried meats, pastry, pies, confections, beer, wines or liquors.

Supper :—White or brown bread, toast, crackers, eggs, or a small piece of cold meat, tongue or fowl, cheese, preserved fruit, small piece plain cake, milk or buttermilk, cocoa or weak tea. Avoid : Preserved or potted meat, hashes, lobster or crabs, sausage, fresh biscuits, strong tea or coffee.

Eat slowly, chew your food thoroughly, drink very little while eating, eat enough but not to repletion, and rest afterward, are all rules to be strictly followed.

Smoking is prohibited unless you have been an

inveterate, when it is not cut off entirely, but cut down to just sufficient to keep the nerves from rebelling.

It will thus be seen that training is not fun and requires steadfast determination to go through with it.

It becomes monotonous to ride over the same road every day, especially if you are out for pleasure, so that occasionally you will go off on an excursion either with a party, or with one or two companions. If you go out with a club, you will probably extract very little enjoyment from your trip. A few of the strong men and experienced riders set the pace and the rest are expected to keep up with it.

The spirit of emulation and rivalry and pride exerts you to keep it up until you are about exhausted and even then you hate to give in. Most of the injurious effects of wheeling can be traced to this source. Most people would not ride too far if they were alone. If they had to go a long distance, they would at least stop and rest. Another common cause of over fatigue, is the habit of some to ride out in one direction until they are tired, forgetting they have the same distance to return. Then if the wind is behind you going out, it will be in your face coming back, and will

require twice the exertion and endurance. When you start out to ride, you should have some definite goal in view and know how far it is there and back by the road you intend to take. If a point is five miles away by one road, it may be ten by a more circuitous one.

If you do not enjoy scenery and variety, stick to the highways and bicycle paths. Otherwise it will pay you to turn off into the byways and cross-roads, now and then. The roads may not be so good, but you will see some of the country which is perhaps new to you.

A century is a run of one hundred miles at one stretch. My advice to the average rider is to never attempt a century. If you ride as far as you feel able, without regard for the number of miles, and when you look at your cyclometer, and find you have made a hundred miles, all right. It will not hurt you, done in that way. But the frenzied ambition, so often met with, to run a century, and brag about it to your friends, is responsible for many of the bad effects of wheeling. The idea back of a century, is to make the run in as short a time as possible. Thereby you miss the scenery, you do not take time enough to eat, or drink, or rest, and you put a severe strain on your muscular and nervous system.

If against this advice, you do attempt a century, you will do it with least harm to yourself by observing the following rules, which apply as well to all riding.

Take it easy. Do not attempt too hot a pace. Walk up the steep hills, especially at the beginning of a ride, or take a road to avoid them. Take plenty of time for eating, and when you are thirsty or tired, dismount, drink a little cool water and rest at least five minutes. When you can no longer breathe through your nose, but must open your mouth, it is time to slow up, or stop and rest.

II.—DISEASES AND AILMENTS.

The physician regards the bicycle as an agent for the weal or woe of the physical health. When the bicycle first came into popular use, the medical profession did not seriously consider it as a factor for good or bad, because the general impression was, that wheeling was simply a fad, a passing fancy, and would quickly run its course to desuetude, as did roller skating before it. But the conclusion gradually became dominant that wheeling had come to stay, and then a shower of literature on the subject fell all around us. Some were violently opposed to it, and others were strongly in favor of it, so that the public, not knowing exactly what to do, went ahead and learned to ride, in ever increasing numbers. Then the clinical cases came in and physicians could consider the effect of wheeling from practical experience. Most of those who were opposed to it changed their opinion, until now there is hardly a medical man who will not concede the virtues of bicycling, under proper conditions and limitations.

That the bicycle may prove hurtful to some people is not denied. Considered as a harmful agent, it can produce injury in two ways. It can cause disease in a healthy individual and it can aggravate existing diseases.

A violation of any of the rules of correct riding is the only method of inducing injurious consequences in a healthy person. Of course a great many people think they are healthy when they are not, and this statement would not apply to them.

Health has been defined as the performance of all the bodily functions by the different organs without consciousness of their existence.

If a healthy person assumes a wrong position, sits in a bad saddle, rides too far or too fast, breathes improperly, etc., they may not become seriously ill, but they cannot derive the best benefits from wheeling.

The ailments which may be produced by faulty riding have been alluded to, but it may not be amiss to mention them again.

Breathing cold air through the mouth may cause toothache, sore throat, bronchitis, etc., beside the bad effects of dust and germs carried directly into the lungs.

A bent position, where, for instance, you try

to sit upright and reach over for your handle bars, will contract the lungs and produce round shoulders. The inclined position, however, throws the shoulders back and expands the lungs.

If you have a faulty saddle, one too narrow or with a ridge in the center which presses on the soft parts, instead of supporting the bony parts, chafing, swelling, tumors, contusions, inflammation of the prostate or scrotum will be produced.

If you ride too fast, you may get a headache or become dizzy from the effect of the rapidly passing objects on the optic nerves, or the singing of the wind in the ears.

Or, if you ride too far, exhaustion, collapse, muscular tremors, weakness, headache, insomnia, loss of appetite, vomiting, nervous depression, melancholia, or even a mild form of insanity, may result. The contestants in the six-days' races, in New York were all hardy, well-trained men, but most of them showed the effect of such long riding by exhibitions of despondency, insomnia, suspicions of foul play, hysterical crying or laughing, refusing to eat, riding backwards, etc.

But taking for granted that the correct method of riding is followed and all the rules observed, it can be positively stated that the use of the bicycle will not only not hurt a healthy person, but

will materially benefit certain chronic diseases, to be hereafter considered.

But let us first take up the diseases which will be aggravated by wheeling.

All acute diseases should necessarily prohibit the bicycle. By acute diseases is meant those diseases which are of sudden onset, rapid progress and short duration. For example, a fever, such as measles, or a cold, such as bronchitis, or an inflammation, such as rheumatism, is an acute disease.

If there is a tendency to apoplexy, wheeling should not be indulged. The excitement and the exertion might cause a rupture, which might result in unconsciousness and death.

Bright's Disease in most of its forms, Consumption when advanced beyond its first stage, Organic heart disease (i. e. when the valves are affected), are all conditions which should taboo the bicycle.

Made into a list they would appear as follows :

1. All Acute Diseases.
2. Apoplexy (tendency to)
3. Bright's Disease.
4. Bronchitis.
5. Consumption (after first stage).
6. Dropsy (symptom)

7. Diarrhoea.
8. Fevers.
9. Heart disease (organic).
10. Inflammation.
11. Rheumatism.
12. Certain Female Diseases (Chapter III.).

There are also certain conditions of health which should forbid wheeling. These will be mentioned in the chapter for women.

As a remedial agent, bicycling is to be considered as curative and as prophylactic. Prophylaxis means the prevention of disease. Bicycling prevents disease by its beneficent action on the general health. We speak of the action of a drug, and we can speak of the action of a bicycle, meaning its action on the human organism—not its mechanical action. Like a drug, its action can be analyzed, and its character classified. Also like a drug, it is potent for good when rightly taken and poisonous when over-dosed or injudiciously administered.

Classified it stands as a tonic, and a stimulant ; tonic to the general system, stimulant to the heart and nervous system. Herein lies the secret of its beneficent influence on certain chronic complaints.

Diseases become chronic because the system

does not fully regain its normal tone after an acute illness. Tonics are given with the view of re-establishing this normal tone and so overcome the disease. How the bicycle does this is an interesting study and worth careful analysis.

In the first place, wheeling is an exercise—an outdoor exercise, and as such exerts its greatest influence ;—for all outdoor exercise is tonic in action. If people would live more generally out of doors and less in artificially heated apartments, the increase in their health would astonish them. But for various reasons, out-door exercise, with the exception of walking, is not accessible at all times, to all people. Mountain climbing, tennis, rowing, swimming, base-ball, etc., etc., etc., demands a certain season of the year. Horseback riding is too expensive but for the few. So that unless one walked all the time, or occasionally ran, his out-door exercise was limited to a few months in the summer. And even then outdoor exercise was not general, because its different forms were not accessible to all.

Is it any wonder that the bicycle was received with such general enthusiasm. It filled a long-felt want. It was attractive, convenient, accessible and inexpensive, suitable for both sexes, old and young, rich and poor ; capable of indulgence

at all seasons, except when snow lay on the ground.

The first effect manifested by wheeling is stimulation. The heart beats faster and with more power. This is necessitated by the action of the muscles, which, when exercised, demand more blood, to carry off the effete carbon dioxide and replace it with oxygen.

The demand for oxygen, which is taken from the air by the blood while it is in the lungs, increases the rapidity and depth of the inspiration. The fresh air supplies oxygen to the blood, and the blood supplies it to the tissues, which become better nourished through this extra supply of nutrition sent to them. Thus the organs secrete more abundantly and perform their function more normally. Digestion is improved and physical power is increased by the more perfect assimilation of the food.

By this somewhat terse explanation it will be seen that if the circulation is improved, each part of the body will be benefited. This is the secret of the success of the bicycle in curing many chronic affections.

Besides being an exercise, wheeling is a relaxation, a diversion and an exhilaration. Many of the chronic nervous affections are caused by too

close an application to business or study, to mental strain, worry or care. Wheeling takes one away from the study, the shop, the office, or the salesroom, with their confinement, or their bustle, or their perplexities and sets the muscles working, and the lungs breathing, and the mind at work in a different sphere :—either the peaceful contemplation of nature, or the excitement of rapid motion and exhilarating sport.

Then the effect of pleasant companionship is not to be overlooked. The social contact of individuals does much to smooth out the wrinkles of care and buoy up the heart of despondency. Brooding over trouble, moroseness, pessimism, all vanish before the tonic of a good companion.

Wheeling is thus seen to possess the stimulating effect of exercise, and the tonic effect of relaxation, diversion, exhilaration and companionship. It stimulates the circulation and thereby the nutrition, secretion and digestion. Remembering this, it will be easy to understand how it helps the affectionous now to be considered.

Acne (or pimples), Eczema, etc.—The blood is improved in quality. The activity of the skin is increased by the exercise and the increased circulation. The action of the wind and sun helps the process.

Diseases of the Head and Nerves: Chorea (St. Vitus Dance), Earache, Epilepsy (fits), Headache, Hysteria, Insomnia, Irritability, Lumbago, Melancholia, Migraine, Nervousness, Neuralgia, Toothache.—By improving the general health the nerves are better nourished. By exercising the muscles the blood is drawn away from the head. The relaxation, change of scene, exhilaration—all rest the mind and restore the balance which is necessary to maintain health.

Diseases of the Lungs and Respiratory Passage: Asthma, Catarrh, Consumption (1st stage), Hay Fever.—The improved general health and increased blood supply have a good effect on these diseases. The increased lung expansion coupled with the inspiration of the fresh air is the best possible treatment for incipient consumption. After consumption has progressed, however, beyond the first stage, i. e. when parts of the lungs are solidified, or cavities exist, bicycling is apt to bring on hemorrhages. It will also cause exhaustion very soon, in this state. Therefore the wheel should be used by consumptives only after consultation with a physician.

Diseases of the Stomach and Digestion: Anorexia (lost appetite), Constipation, Dyspepsia, Flatulence, Gastric Catarrh, Indigestion.—This

is the class of diseases most benefited by wheeling. The exercise, the fresh air, the exhilaration, etc., increase the appetite. The increased supply of improved blood sent to the organs elevates their tone to the limit of health and the glands secrete more freely. Thus the food is better digested and constipation is overcome.

Diseases of the Heart and Circulation : Anæmia (paleness), Fainting Habit, Heart Disease (certain kinds).—The improved condition of the blood helps the Anæmia. The only thing to do where heart disease is suspected is to consult a physician and abide by his decision. It would be impossible to instruct the general reader how to tell what kind of heart disease he has. If you become short of breath on going upstairs, or after other slight exertion, or if your heart palpitates, or your skin gets blue at times, or your feet swell, you would better see a physician at once, for they are symptoms of heart disease. In all functional disorders of the heart, bicycling does good. For instance, smoker's heart is a functional disease, as is also nervous palpitation.

Diseases of the Liver and Kidneys : Bright's Disease (chronic), Jaundice, Torpid Liver.—The general systemic improvement exerts a ben-

official effect on these diseases. The liver is more profoundly affected by horseback riding, but the influence of wheeling, if not so marked, is at least good.

General Systemic Conditions : Atony (Emaciation), Debility, Gout, Malaria, Obesity, Opium Habit, Scrofula, etc.—As wheeling tends to boost the general health up to its normal standard, these conditions, which exist only as the result of, or in conjunction with poor health, are markedly benefited. Obesity is itself a disease, and as such will be relieved by anything which tends to improve the general health. This is one way in which wheeling reduces weight. The other is by the combustion incident to the exercise. Many people do not understand how wheeling will make one person stout and reduce the flesh on another. Excessive thinness or excessive fatness are both variations from the normal health standard which is peculiar to each individual. By helping the system to approach this individual standard, the trick is done.

Female Diseases will be considered in the next chapter.

If an alphabetical list of the diseases which are benefited by the bicycle were made, it would appear as follows :

1. Acne (pimples).
2. Anæmia (paleness).
3. Anorexia (lost appetite).
4. Asthma (hay fever).
5. Atony (emaciation).
6. Bright's Disease (chronic).
7. Catarrh.
8. Chorea (St. Vitus' dance).
9. Constipation.
10. Consumption (1st stage).
11. Debility.
12. Dyspepsia.
13. Earache.
14. Eczema.
15. Epilepsy (fits).
16. Fainting Habit.
17. Flatulence (wind on stomach).
18. Gastric Catarrh (catarrh of stomach).
19. Gout.
20. Hay Fever.
21. Headache.
22. Heart Disease (certain kinds).
23. Hysteria.
24. Indigestion.
25. Insomnia.
26. Irritability.
27. Jaundice.

- 28. Lumbago.**
- 29. Malaria.**
- 30. Melancholia.**
- 31. Migraine.**
- 32. Nervousness.**
- 33. Neuralgia.**
- 34. Obesity.**
- 35. Opium Habit.**
- 36. Scrofula.**
- 37. Toothache.**
- 38. Torpid Liver.**
- 39. Certain Female Diseases or Conditions.**

III.—THE BICYCLE FOR WOMEN.

The advent of the bicycle was a glorious boon to womankind. Multitudes of the fair sex owe increased health and lighter spirits to this ingenious mechanism, aptly yclept the "silent steed." Time was when women were regarded as chattels, the same as chairs or bedsteads, and they were exchanged and bartered like horses or cows. Ever since that time woman's emancipation from the enslavements of habit, custom, fashion and conservatism has been continuous and progressive, until now the bicycle seems destined to annihilate the last remaining fetter which binds her to servitude and renders futile her effort to be man's equal, if not his superior in everything save crude strength. The subject of woman's dress has occupied the minds of philosophers and demagogues for a long time. In spite of all the efforts of reformers to change it, the trailing skirt is still with us—or rather, has been with us until the bicycle wrought a change.

From time immemorial, woman has been clothed in the very graceful and modest but

very unhygienic and inconvenient trailing skirt. Whether our great-great-grandmothers regarded them as a nuisance or not, has not been handed down by history, so that we do not know, but it is positively asserted by the women of to-day that long skirts are decidedly inconvenient at times. Especially those women who exercise the privilege of this decade and take part in business declare the long skirt hampers them in many ways. In wet weather it becomes wet and muddy and uncomfortable and dangerous to health. In dry weather it sweeps the streets and stirs up the microbes in swirling dust clouds. But the main objection to it by the up-to-date woman is its impediment to the pursuit of exercise in a free and untrammelled way. So great is the impediment that when bicycle riding was attempted with long skirts, it became dangerous, and the alternative immediately arose either to eschew the bicycle or discard the skirts. So strong had the love of the wheel grown in the female breast that all the precedent of ages was thrown to the winds; the bicycle was retained and the skirts cut down. Thus did the bicycle accomplish what reformers and philosophers and demagogues had striven in vain to do.

But as important as the reform in dress is, the

bicycle has succeeded in effecting another innovation in the life of women. It has taught her that the condition of health depends a great deal upon regular systematic exercise. Not that this is a new theory just discovered ; it has been recognized for ages, and its precepts followed by the male sex generally and a few sensible women who have organized gymnasia and athletic clubs. But it takes a great deal of strong mind and tenacity of purpose to swing clubs and pull at weights for any length of time, and then it is not out-door exercise, and is devoid of the spirit of sport. So that the scope of the gymnasia and athletic clubs was limited to the few.

The great majority of women had no opportunity for healthful out-door exercise, except such as was presented for a few months in the summer season. Even then only the few were benefited, for rowing, or mountain climbing, or tennis, or swimming, depended upon a trip to the country, which in itself was expensive if extended, and a trip of a few weeks was of no material benefit, for it could not be expected to last over the fifty weeks of the rest of the year.

Then what was the daily life of the average woman during the winter months ? Those who did not occupy themselves with house-work, which

is woman's safety-valve for many of her nervous troubles, were compelled to sit around in-doors, during the day, reading or sewing or gossiping, and building up towers of headaches and mountains of backaches ; or perhaps indulging in a shopping tour, with its constant standing and walking in dusty streets and dustier stores ; jostling and pushing amidst bustling crowds ; a tension to the nerves, a strain to the muscles and an insult to the lungs.

The manner in which the evening to such a day was spent was even worse. A trip to the theater means from two to three hours in an overheated, poorly ventilated room, sitting still in a narrow seat, often with the street wraps unremoved. Many people on coming from a theater have a desire to yawn and stretch themselves—signs that the system needs exercise. Men primarily went out between the acts simply to stretch themselves and get a breath of fresh air. The drinking was an afterthought. If not to the theater, perhaps a dance is attended. The same unsanitary conditions of overheat, bad ventilation and dust prevail here, no matter where the dance is given. If the dancing is done on a crash or carpet, fine particles of floss or napp are whirled into circulation, to be inhaled ; and if on

a board floor, although not so bad, still some dust and fine splinters will find a resting-place in the lungs.

The evening may be spent in bowling. Women entirely unused to muscular exertion will attempt to bowl an entire evening, with the effect that their right arm is nearly paralyzed before they cease and remains lame for days afterward. Bowling would not be so bad, if both hands were used, but as it is at present, only one side of the body is developed.

If one wants to be convinced of what bicycling has done for our women, let him compare a modern, up-to-date bicycle girl with a girl who has followed a mode of life similar to that outlined above. The springy step, the erect carriage, the clear eye, the fresh complexion, the well-balanced poise of the head and body, all proclaim the new order of things—the triumph of the bicycle.

Wheeling is an alluring outdoor exercise. It can be indulged during the major part of the year by old and young, rich and poor, male and female. It is a sport which will permit of single solitary enjoyment or participation by any number of people together. It is particularly attractive to women on account of its novelty. It is something new for them to have opportunity to enjoy ex-

hilarating out-door exercise without restraint. The rapid and easy motion, the companionship, the competition, the exploration of new country, each adds its charm. The bicycle has become a fixture in the life of womankind.

Compared with horseback riding, wheeling has everything in its favor. In the first place the position of the rider on a bicycle is vastly better than that usually assumed by women on a horse. When women progress far enough to ride a horse astraddle, this difference will vanish. The attempt to sit on a horse sideways and look straight ahead is wrong in principle and detrimental to physical beauty. The wonder is that more cases of curvature of the spine are not reported as the result of the present fashion.

The jolting of horseback riding is regarded by some as good for the liver. This is not denied here ; but if good for the liver, it is decidedly bad for the pelvic organs. In wheeling there is no jolting to speak of.

The cheapness of the bicycle compared with the horse is apparent to all. The silent steed requires no stable, no feed, nor any water. Safety is also a consideration of importance. Although many cases of bad falls from the bicycle have been reported, they are due to carelessness of the rider,

generally. A wheel will not get frightened and run away, or shy, or balk, or otherwise misbehave, as a horse is apt to do.

Critics, dissenters and moralists have antagonized the bicycle for women for various reasons, chief among which is its moral influence. This phase of wheeling has acquired such importance through sensational discussions and newspaper articles, that it will be carefully considered in the next chapters. The other pretext of the critics lies in the field of health.

The subject is of course an important one, for everybody prizes health. Especially is this so in the feminine world. The questions usually heard on all sides are :—"Is it healthful for a woman to ride the bicycle?" and "Are conditions of chronic female complaints benefited by wheeling?"

The argument most commonly advanced by the critic is that bicycle riding is akin to operating on the sewing machine, and it is hard to understand how a physician can recommend one and condemn the other.

It ceases to be difficult of comprehension when the two are analyzed and their differences contrasted, for they are as different as can be.

The sewing machine necessitates a stooping

posture, similar to that assumed by some people in writing or studying. It is fine work : the needle must follow a straight line close to the edge of a fabric and not run over the edge. Close application is necessary, and the eye and the mind are constantly concentrated on the work going on, at the same time the legs are constantly moving from the knees down, in a see-saw motion, and both together. They occupy a position in advance of the body and support none of its weight. There is no alternate motion such as the spinal cord is accustomed to in the acts of walking, running, etc. Add to this the fact that the operator is sitting still, in a confined, indoor atmosphere, with no diversion or change, for perhaps a whole day at a time, and you have before you the factors potent in rendering sewing by the machine harmful.

In bicycling there is no stooping posture ; the eyes are not concentrated upon a spot within twelve inches of the nose ; there is abundant motion, lots of excitement, plenty of diversion ; the legs are under the body, supporting part of its weight and working alternately as in walking ; the thigh and hip, and, for that matter, the whole body, as well as the lower leg, is exercised ; and the operator has plenty of fresh air and sunlight.

Thus it will be seen the two are incomparably different.

Another contention, advanced by some medical men, is that riding the bicycle is apt to render child-bearing more painful and dangerous than heretofore. They reason that by increasing the strength and power of the perineum muscles, they will more effectually resist the birth of the head, and instead of the sphincter dilating it will rupture.

The fallacy of this reasoning can be proved in a few words. Bicycle riding tends to make childbirth easier and safer in the following way. A muscle will perform its functions more naturally when it is healthy and sound. Bicycle riding tends to bring all the muscles, tissues and organs up nearer to the perfect health limit. The natural function of the perineum muscles is to support the pelvic contents, it is true, but they are also supposed to stretch easily when required to do so by the efforts of nature to expel the foetus. Then the uterine muscles and the abdominal muscles, being healthier and stronger, exert more propulsive power, which would more easily overcome the resistance of the perineum muscles.

Of course the healthfulness of bicycling is modified by the conditions under which it is prac-

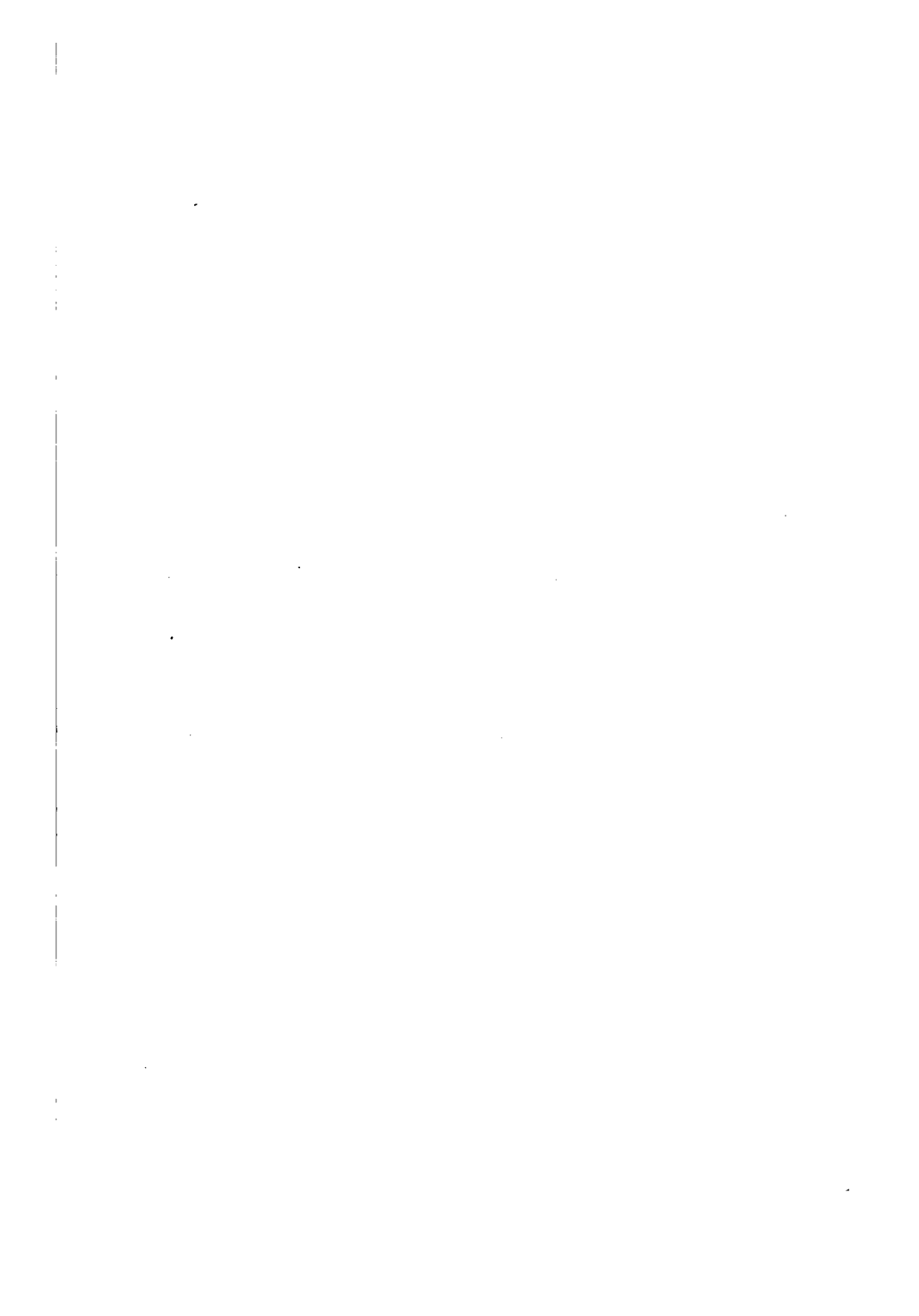




PHOTO BY BUTLER

Upright Position (female)—Loop Frame Wheel—Long Skirt Costume—
High Handle Bars

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ticed. The costume, the position of the rider, the length of the ride and the method of riding are all factors to be counted in. But taking for granted that the fair rider is anxious to, and is doing everything right, the question, "Is it healthful for a woman to ride?" is simplified and can be answered with one word, "Yes."

There is no valid reason why a woman may not derive as much benefit from cycling as a man. True, she is built differently, but she breathes the same air, eats the same food, and she has a heart and muscles that need exercising to keep them healthy. The theory seems to be perfectly correct that what is good for a man's muscles is also good for a woman's.

All that has been said in the previous chapters refers equally to women as to men. It should be understood, however, that a woman, being more finely organized than a man, cannot endure as much hard work, nor for so long a time. Therefore her rides should be shorter. She also suffers more nerve strain than a man; therefore her riding should be slower. With these amendments the same rules of hygiene govern the female bicyclist as the male.

"But you don't mean that a woman should bend over like a man?" Precisely, if you will sub-

stitute the word "incline" for "bend." The inclined position is the only rational one to assume on the bicycle. The definition of this position and its many advantages have been carefully considered in the chapter on Hygiene. If it is advantageous for a man to ride in this position, it is equally so for a woman. Even supposing she is conformed differently in certain parts, it simply necessitates a change in the form and adjustment of the saddle—not the position.

In addition to the better control of the wheel and the greater facility for the exercise of the power, the inclined position has a correcting influence on a female complaint which is commoner than it ought to be in otherwise healthy young women. Reference is made to the backward displacement of the womb. The causes which produce this condition are various, but one of the commonest is the habit of bending over a desk while writing or studying. Here the pelvis is straight while the body is bent at the small of the back and the shoulders brought forward. All the abdominal organs are thus crowded down on the anterior aspect of the uterus, pushing it backward and straining and stretching the round ligaments which are meant to hold it in place. Now what does the inclined position on the bicycle

do? It tilts the pelvis forward too, so that its inclination is exactly the same as that of the body:—they form a straight line. The organs are not crowded down but occupy their normal positions. The round ligaments are relaxed by the falling forward of the body of the uterus, and are enabled and stimulated to regain their tone and take in their slack, by the increased nutrition sent to them by the healthful exercise.

But if the inclined position is assumed, it is necessary to have a saddle which is so formed that it will support the bony points of the seat (called the ischial tuberosities), and not cause any pressure on the soft parts. In order to effect this, the saddle must be wide enough in the posterior two-thirds to full contain the buttocks, and narrow enough anteriorly to avoid chafing the thighs.

This brings up the important question, “Which of the saddles on the market is the best?” Almost every conceivable invention of a saddle is now manufactured, so that there is a wide choice and almost everybody can be satisfied.

A woman's saddle should be wider than a man's, and a woman with a wide pelvis should have a wider saddle than a woman with a narrow pelvis. Stoutness does not necessarily imply the posses-

sion of a wide pelvis. I have seen very slender women with very wide pelvis. When choosing a saddle the best way is to select one which you think will meet your requirements and then try it. If it causes pressure or soreness where it ought not to, change it, for it will be dangerous to try and break yourself into a faulty saddle as people break in new shoes. There is a concern in New York where they fit saddles to each individual. Impressions of the seat are taken in plaster, and the saddle is constructed after the model so obtained, and a perfect fit guaranteed.

A saddle for women should not contain a raised pommel ; rather a depressed one. Some saddles have no pommel at all, the rider sitting on them as on the edge of a chair. They are not comfortable to riders who do not ride a great deal in their pedals. The vicious "center ridge," or "ridge pole" saddle, formerly seen so frequently, is seldom seen nowadays. It was the chief fault of a cheap saddle. The sagging of the leather on either side produced a ridge in the center which was the cause of many injuries. The "hammock" or "sagging" saddle was produced in the same way—the weight of the body causing the center to relax.

The adjustment of the saddle is next in impor-

tance to its shape. You will have to find out your own proper adjustment by your experience. On general principles, for women, and in fact for all riders, the saddles should be straight—neither tilted up or down in front. If tilted, the poise is at once destroyed, the proper support gone and the adjustment of the parts altered, so that a good fitting saddle, wrongly adjusted, may be more injurious than the worst saddle made.

When you first begin to ride you will like a soft, cushiony saddle, a regular feather-bed sort of saddle, for you will sit in it with your whole weight, especially if you affect the upright position. But after you have become a proficient rider, and abandoning the upright position assume the inclined, you will want as hard and light a saddle as you can find. The reason is you will have learned to ride more in your pedals, using your saddle only as a rest to be leaned against. Even in horseback riding, a good mount rides in his stirrups, using the saddle only as a rest.

The costume which is proper for a woman to wear has been the subject of more literature, more discussion, more argument and more difference of opinion than any other one phase of wheeling. Modesty has been pitted against serviceability, morality against attractiveness, and con-

servatism against progression ; and a right royal combat was waged until Dame Fashion stepped into the arena and settled all disputes by proclaiming " le habilimente propré " to be a short skirt, reaching half-way from the knee to the ankle, and leather leggins or boots. The skirt was made full and bloomers were worn beneath.

This kind of skirt, however, had its drawbacks. At times it was awkward, got caught in the wheel and in the pedals, and was immodestly tossed by the wind. A few women abandoned it altogether and appeared in bloomers, but such a howl of derision was raised that the bloomers soon went out of sight.

At this stage a fashionable New York *modiste* came to the fore with a costume which he designed and called after himself, the " Luey costume." It consists of a divided skirt so arranged that when the wearer stands it falls together and looks exactly like a complete skirt, but when seated on the wheel, it divides in the back, to hang down gracefully from the saddle. So popular has this costume become that it is now worn by four-fifths of all the female bicylists in this vicinity.

But whatever kind of a costume you select, be sure it does not confine the movements of your



PHOTO BY BUTLER

Correct Position—Luey Costume—Loop Frame Wheel—Droop
Handle Bars

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body, or constrict any portion of it, for you need all the freedom possible. Tight corsets while exercising do damage in many ways. The stomach and spleen are pushed upward and backward, against the heart, interfering with its action. The liver is pressed upon and pushed upward, diminishing the space in which the lungs expand. The intestines are crowded down on the pelvic organs, which are liable to be displaced, and the pressure on the large vessels causes a stagnation of blood in the valveless veins of the sexual organs—a potent cause of many of the ailments peculiar to women.

If the corsets are abandoned and the waist constricted by tight waist-bands of skirts, etc., it is worse than if the corsets were worn, for the constriction then is a narrow string, while the corset is a diffuse pressure. Health waists are no better than corsets if worn tight. It is true they have no steels, and this is an advantage. They are the best to wear if something of this nature must be worn. They preserve the shape and support the back muscles, which are weak in women who have worn tight corsets for a long time.

It would be better if women went without corsets, even if they put them on again after leaving the wheel. An immense advantage to health

would accrue, but personal appearance would suffer, and this is a great desideratum in most feminine eyes.

Considered from a hygienic point of view, the best and simplest costume yet devised for women is as follows :—

1. Union garments of silk or thin wool.
2. Equestrian tights from knee to waist, or bloomers same as for men.
3. Stockings.
4. High boots.
5. Shirt waist or woolen waist.
6. Short skirt.
7. Eton or Luey jacket.
8. Alpine, Derby, straw, or Tam O'Shanter hat.

The equestrian tights are made of heavy woolen and reach to below the knee. The stockings are held up by the band of the tights or bloomers. Garters should not be worn, as they constrict the surface veins and may cause varicose veins. The boots should fit well and lace snugly to just below the knee. The skirt should be short enough to clear the pedals. On most women of average height, this would bring it to a few inches below the knee—a point entirely modest and very becoming. The jacket may be discarded on hot days. The choice of hat will depend on individual fancy

and taste. Derbys are not becoming to all faces. A trimmed hat looks as bad on a wheel as a silk hat would look on a man.

Although this seems to be the regulation costume for women, a great variety can be obtained merely by the choice of material. Individual taste and personal requirements will of course be consulted in this matter, but a tip may not be amiss. Brown is a color which is most serviceable and looks best under all conditions of travel. A black suit will become covered with dust and look nasty; a blue one will fade; and so on through the list of the colors. If a woman wears a plaid or other loud color, or a combination of striking colors, she will attract attention and perhaps incite ridicule or occasion unkind remark.

Cloth or leather leggings, worn over ordinary shoes, make the leg and ankle look clumsy and awkward. It is far more becoming to wear no covering at all over the stocking, and in warm weather it is vastly more comfortable. Low shoes with black or tan stockings are getting to be very commonly worn now.

Sweaters are worn by many women, either with or without a coat over them. They are comfortable on cool days, but are not very becoming. The combination of a sweater with bloomers and

a Derby makes a girl look very mamish and perhaps "tough," especially if she rides a diamond frame wheel and bends over like a scorcher.

The diamond frame wheel is much better than the loop frame to ride on if one's skirt is short enough. Its advantages are : It is lighter ; it is more compact and handier to manage ; and it is easier to maintain the correct position upon it. If the skirt is a divided one and reaches only to the knee, the diamond frame may be used with safety and propriety. To mount it, the skirt must first be lifted over the saddle and then the mount made from the rear over the saddle in the same manner as described in a previous chapter.

Of the effect of wheeling on the female organism, much might be said and little understood by the lay reader. Therefore I will confine myself, as far as possible, to common terms, and endeavor to explain clearly and concisely the nature, causes and consequences of the numerous female complaints, and to show how the bicycle affects them.

The diseases peculiar to women which may be benefited by wheeling are :—

Painful Menstruation.

Backache.

Constipation.

Headache.



PHOTO BY BUTLER

Bloomer Costume—Scorcher's Position—Diamond Frame Wheel—
Ram's Horn Handle Bars

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Nervousness.

Hysteria.

Malaise, or "Tired Feeling."

Leucorrhœa, or "Whites."

The manner in which the bicycle helps these ailments involves the same principle which governs its effect on other diseases. The healthy outdoor exercise and muscular exertion, stimulating the heart and circulation, carries better nourishment to the organs and tissues, giving them a healthier tone and an ability to perform their function more naturally. The increase in the general health exerts a marked influence on local disease—an effect which prolonged local treatment may fail to accomplish.

Painful menstruation is a female disorder more common than it should be. Normally this function should be painless. It was never intended that women should suffer during this period. The causes are various, and are mostly due to a faulty development or position of the uterus and chronic inflammation of that organ. The bicycle will not help it if caused by a tumor or deformity, but if due to a chronic congestion or inflammation, the wheeling does good by improving the tone of the pelvic organs.

Backache is probably the commonest of all

female complaints. It accompanies almost all of the disordered conditions peculiar to women. Some of the more frequent of its causes are:— Backward displacement of the womb, chronic inflammation of the uterus or ovaries, tumors, and procidentia, or falling of the womb. If your backache is caused by chronic inflammation of the uterus and ovaries, it will be benefited by bicycling. But if there is present a fixed backward displacement it will be only aggravated by wheeling. If the displacement is movable, and the womb is placed forward by your physician, and treated locally, discreet bicycle exercise is immensely valuable and may exert a complete cure. The bicycle cannot help the backache caused by tumors or falling of the womb.

Constipation is produced from the same causes as backache, together with the contributing causes of sedentary habits, inactivity and errors of diet. It is common to nine-tenths of all women, whether they have anything else the matter with them or not. It may be cured by wheeling if it be caused by sedentary habits, inactivity, errors of diet, or movable displacements that are treated: but it will be only slightly relieved if the additional conditions mentioned under backache are present.

Headache goes hand in hand with backache. It is sometimes the only symptom that a woman will complain of. A celebrated professor of therapeutics has said there are fourteen kinds of headache, and therefore fourteen causes of it. If your headache is located in the top of your head, and is more severe at the time of your period, you may attribute it to your ovaries. If it occurs in the front part of the head, through the temple, look out for your stomach and cure your constipation. If in the back of the head, perhaps the entire contents of your pelvis are chronically congested. Wheeling exerts a markedly good influence on all kinds of headache. The general toning up of the organs, the exhilaration of the exercise, the change of the scene and the fresh air have a more potent influence than any drug.

Nervousness, hot flashes, cold hands and feet, flushing, etc., are all manifestations of the nervous system due to a local disturbance probably in the ovaries.

Hysteria is this nerve manifestation accentuated. The name itself is derived from the Greek word "Hyster" meaning uterus, and applied by the ancients to that profound disturbance of the nervous equilibrium emanating from the uterus.

Wheeling helps these nervous disorders by relieving the nerve tension in much the same manner as a locomotive "blows off" its accumulated steam, when it is at a standstill. If the steam was retained an explosion would result. Hysteria is an explosion of the nervous system and bicycling is a newly invented safety-valve.

Malaise, or "that tired feeling," or laziness, whichever you wish to call it, is frequently caused by an unhealthy condition of the sexual organs, coupled with constipation and inactivity of the liver. It may also be caused by overwork, and then the remedy is rest. Otherwise a little work often cures that tired feeling. Some wit has tersely said, "If you feel tired, work it off." The kind of tired feeling which wheeling helps is that caused by indolence,—the stagnation of the system's machinery. A ride in the open country revivifies the whole system.

Leucorrhœa, or "whites," is not necessarily an indication of weakness, as many suppose. When you have a cold in your head, the nose secretes abundant mucus, as is commonly known, and the cause is understood. The neck of the womb secretes a mucus, because there is a chronic congestion present, and this secretion is Nature's method of relief to it. Another cause may be

lacerations or tumors. When these are present, bicycling will do more harm than good. Otherwise wheeling is very beneficial to leucorrhœa. The force at work here is the increased blood supply and the improved nutrition of all the pelvic organs.

The bicycle is not a panacea for all the ills of womankind. It has its limitations, and there are certain conditions in which it will do absolute harm.

Pelvic tumors of all kinds are a contra-indication to the use of the bicycle. From its use these tumors may be stimulated to grow larger by the increase in the blood supply to the pelvis.

Acute inflammation should, of course, prohibit the wheel, as should the condition of pregnancy. Wheeling will also be much safer dispensed with during the period of menstruation.

Lacerations of the pelvic floor should be repaired before wheeling is attempted.

Adherent retroversion, or fixed backward displacement of the womb, should be treated first, the adhesions broken down and the uterus replaced before wheeling will be of service as a curative agent.

Wheeling is prejudicial to procidentia, or fall-

ing of the womb, and should not be practiced if this condition is present.

The bicycle has been known to have a favorable effect on the nervous disturbances of the menopause, or change of life. It may seem to some that forty-five years of age is rather late in life to begin bicycle riding, but it is not an uncommon sight to see gray-haired men and women astride a wheel on the boulevards or pathways, enjoying it as much as the youngest.

When a woman undertakes to ride a wheel, it will pay her to remember the following tips :

Be careful to increase the length of the ride gradually.

Always dismount and walk up steep hills.

Never go so fast that breathing becomes labored.

Never sit down on damp or cool ground when heated.

Learn to use the pedals instead of the brake.

Rest frequently during long rides and after riding.

If the heart palpitates stop and rest.

The future of bicycling for women is even more promising than its present is fulfilling. What is done by the present generation will have its effect on future generations. With healthier women will come healthier children. And child-

bearing itself will be easier. As the health of woman increases, she will acquire stronger muscles and steadier nerves. Her menstrual periods will tend to become painless. And last, but not least, she will wear a more hygienic dress—an epoch toward which the female world has been struggling for a century.

IV.—MORALITY.

I have run across so much that has been said and written derogatory to the bicycle as a moral agent, and defamatory to the fair name of its female devotees, and, meeting with none who has had the temerity to defend them, I am impelled to take up this theme with much hesitation, for fear I may cause offence to some, but with the hope that I may correct the wrong impressions of many, if I may not convince all, and with the firm conviction that my arguments are tenable and are worth setting forth, even if they can be disproved.

The moral side of bicycling has almost as much to do with the physician as the physical side, for morality is closely related to health. But aside from this, a physician, by reason of his learning and favorable opportunities for observation, has a vantage ground from which he is a powerful factor in molding public opinion.

The female riders are mostly concerned in the morality of bicycling. By old tradition and long custom, a woman is debarred from the moral



PHOTO BY BUTLER

Diamond Frame Tandem—Male Position Correct—Female Position inclines a trifle too much—
Divided Short Skirt

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freedom that is accorded to man. Whether she will ever demolish this difference is for the future to tell. At the present time, a woman has to consider very carefully the moral effect of everything she does.

Since the bicycle became popular as an exercise for women, hosts of social reformers and demagogues have arisen to denounce it as an immoral institution. Newspapers and magazines have been flooded with their arguments and assertions, and anti-bicycle crusades have been launched, until it was thought that surely such an evil would take wings and fly away ; but, lo and behold, what is the result ?—More women ride bicycles now than ever before.

The most grievous and lamentable charge that the anti-bicyclists make against the fair name of the female riders is unfortunately not advisable to take up for discussion in a book of this kind. It has been discussed and argued and refuted in the medical journals throughout the country, but in spite of the fact that it has been proven to be impossible, some people still think it a logical sequence to riding the wheel.

The subject of short skirts has received more attention and open discussion than any other of the moral aspects of cycling. The reformers have

harped upon this theme until it is threadbare. The public has been impressed by their arguments, but not influenced much, for shorter skirts are now worn more than ever before.

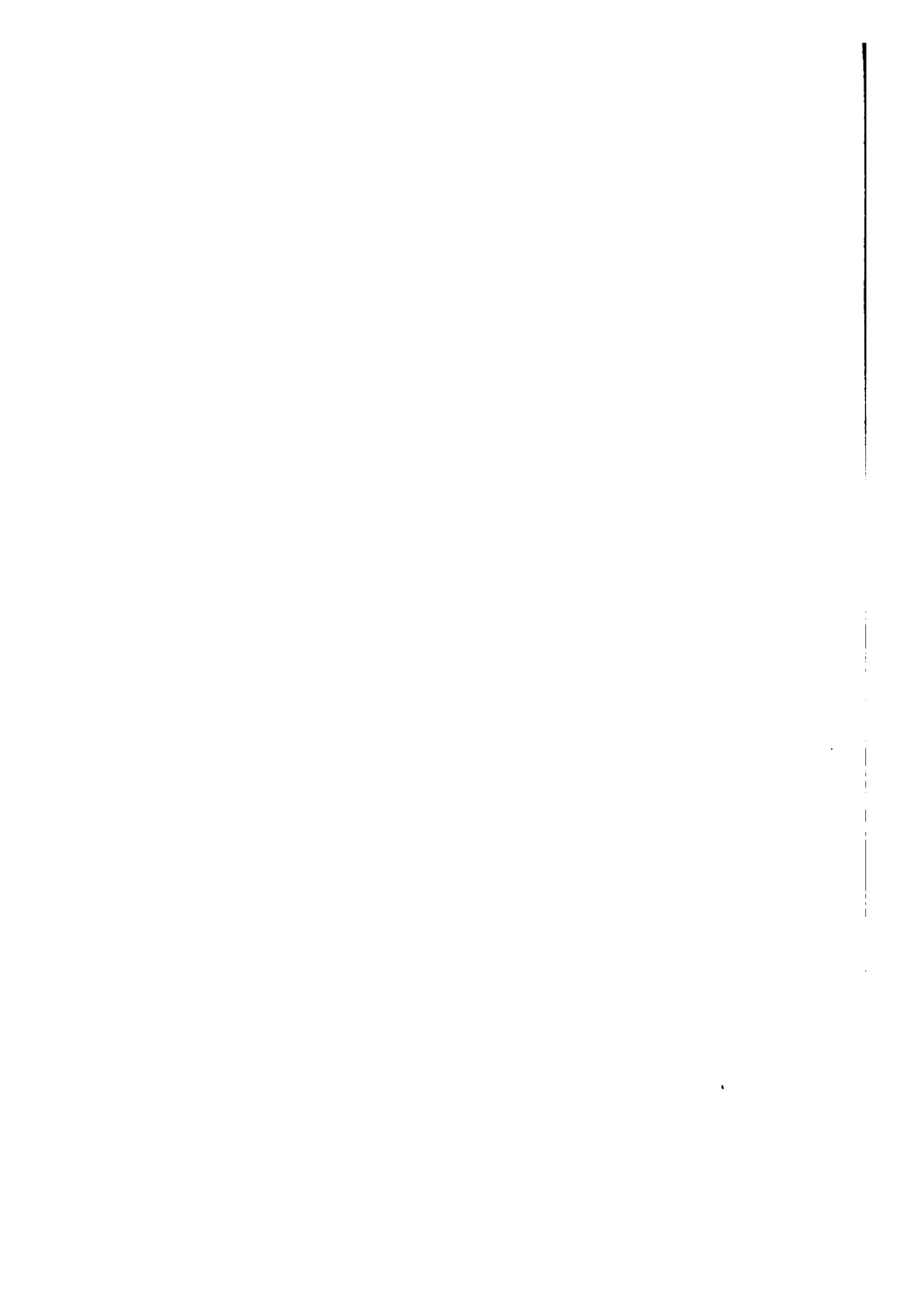
When bicycling was first essayed by women, everybody realized the danger that lurked in the ordinary long skirt. All manner of devices was invented to prevent the skirt from catching in the wheel and pedals, but without success. Every woman who rode the bicycle was in constant danger of a serious fall. Then a few courageous women abandoned the long skirt and donned a shorter one, and were stared at and ridiculed by the public. The public, however, soon realized the good sense of the innovation, and then the great crowd of female riders followed the suit led by the brave pioneers, and short skirts became a recognized essential to bicycling. The pendulum of reform swung even further, as it always will when once started. Some women discarded skirts altogether, appearing in bloomers. Others donned even tight knickerbockers, sweaters, derbys, and rode diamond frame wheels, so great was their zeal to shake off the enthrallments of femininity. This, however, was overdoing the thing, and the public revolted. It was not necessary to discard the skirt entirely, and there-



PHOTO BY BUTLER

Female Scorchers—Male Attire—Diamond Frame Wheel—Ram's
Horn Handle Bars

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fore it was not universally done. A short skirt was considered to be safe, appropriate and modest, and it is now the recognized costume for female cyclists.

It is amusing to observe the transitional stages of a woman's conception of modesty, as she takes up wheeling and progresses in it. At first a skirt six inches off the ground is plenty short enough. After wheeling a few weeks an additional few inches are amputated, for she has found that the skirt catches in the wheel and on the pedals, and perhaps she has had a few falls therefrom. When she has been wheeling a few months the skirt has shrunk to her knees, not from the action of the elements, but by means of her scissors. She will tell you, if interrogated, that her ideas of modesty have changed. She no longer considers it modest to endanger her life and health for the sake of keeping a few inches of her leg under cover.

All of which brings forcibly to mind the fact that dress is merely an arbitrary custom, any way. It is because we are brought up to regard women as an exposition of dry goods, that we are so wrought up when we become visibly aware that a real live body exists beneath the drapery. There are certain countries where clothing is not worn

at all, and yet the honor and morality of the populace, considering their barbaric state, is better than ours. The Greek historians tell us that, during the reign of Lycurgus, the Spartan lawgiver, in Greece, the "younger women were encouraged to wear exceeding scanty costume, and the virgins were accustomed to dance and sing unclothed in the presence of the young men, in the national festivals." This historian further states that "by wearing the scanty garment, or none at all, the Spartan girls had freedom in the exercises of running, wrestling and throwing quoits or darts, and their bodies became strong and vigorous."

Plutarch, the famous moralizer, comments on this custom as follows: "As for the virgins appearing naked, there was nothing disgraceful in it, because everything was conducted with modesty and without one indecent word or action; nay, it caused a simplicity of manners and an emulation for the best habit of body; their ideas, too, were naturally enlarged, while they were not excluded from their share of bravery and honor."

But the United States is neither a cannibal island nor the land of Lacedæmonia. We are governed by our inherited ideas on the subject of modesty. If we are to be educated to a higher

plane of thought it must be done gradually. The abbreviated bicycle skirt is the first step in that direction.

When the reformers denounce the bicycle short skirt, they overlook two other grosser evils in the realm of modern dress. The bicycle costume does not expose the person so much as either the ball dress or bathing costume. In the ball dress the neck and bosom, a portion of the back and the arms are bare. In the bicycle no part of the body is bare but the face. The bathing costume is a more complete *exposé* of nature than the ball dress. Beside the parts that are bare, the entire shape is revealed by the clinging suit, when it is wet, and the legs are exposed far more than is the case in the bicycle costume. Yet the public has viewed with equanimity these two established customs of dress, while decrying the growing popularity of the short bicycle skirt. Not that any of them, the ball dress or the bathing suit or the bicycle costume, should be considered immodest:—they are simply referred to here for the purpose of comparison. The public has become used to two of them, and they will get used to the third. It is simply a case of getting used to it.

The subject of Sunday riding has enjoyed periodical discussion every since the popularization of

he bicycle. Arguments for and against it have been hurled back and forth by prominent minds, until now the general opinion, even of clergymen, seems to be that cycling on Sunday is a far less evil than many of the pleasurable pursuits heretofore regarded as not violating the Sabbath. Carriage riding, traveling in cars, cabs or railroads, or patronizing pleasure resorts, necessitates work on the part of other people, the same and more than they do on week-days. Bicycling requires the labor of none save the rider himself—and he does not regard it as labor, but pleasure.

Ministers have complained that Sunday bicycle riding takes people away from the church services. Supposing it does, is not the sermon in the brook, the song in the throats of birds, the evidence of God's handiwork in the trees, and grass, and shrubbery, His smile in the warm sunshine, and His caress in the cooling breeze, a good substitute for a dry discourse on theology in a dark, close church?

There are a great many people who never have opportunity for riding during the day, except on Sunday. Night riding is not as pleasurable nor as healthy as riding in daylight. These people are refreshed and stimulated for the ensuing week's

work by their ride into the open country on Sunday.

The claim that the Sunday bicycling crowds are noisy, boisterous, profane, etc, has some foundation in fact. Rome was not made in a day, and a gentleman or lady cannot be made in a season. Sunday is the one day in the week when the masses have opportunity to ride. It is no wonder that their joyousness at their unwonted freedom and pleasures should be noisy and boisterous. Liberate a bird from a cage, and it too will sing in gladness. Untie a dog and he will vent his pent-up spirits by gamboling about you. The human animal gets loose once a week and disports himself awheel. Time, however, will effect a change. When the novelty of the Sunday riding wears off, quiet gentlemanly conduct will be assumed by all, if it is only for the sake of appearing well-bred.

Drinking on Sunday is not much indulged, probably because prevented by law. Even if it were not, saloons would not be patronized much by wheelmen, because most of them realize that liquor and the bicycle are incompatible. It requires a clear head to ride the bicycle. However as long as there is evil in the world, it will flourish in some places. Some men, and, sad to relate

some women, will drink, whether they ride the wheel or not. But the vast majority of bicyclists drink to relieve thirst—drink soft drinks such as lemonade, soda, etc. It is explained elsewhere how hurtful this practice is.

Once in a while, one reads in the papers of a young girl going out on her wheel, meeting a chance acquaintance and being led astray. An article in a recent medical journal tells of a case in the writer's personal experience, where a young woman in strange, picked-up company, so far forgot herself as to drink a glass of wine, which was drugged, and was then "marched off for immoral purposes, amid the delight of her captors."

Many people jump at the conclusion that the bicycle is responsible for such cases. The article alluded to takes this narrow view of it. The bicycle is no more responsible for it than a horse and carriage, or a flying-machine would be, for that matter. It is true the bicycle gives to women more freedom than they have heretofore enjoyed, and it is not surprising that a few silly, weak-minded women lose control of themselves when they have liberty thus thrust upon them. Girls of this kind have probably never been taught how to take care of themselves, but have been closely

guarded at home as though they were inmates of at harem.

It is the proud boast of America, that her women can take care of themselves wherever they are, under all circumstances. It is not necessary to lock her in a convent to protect her virtue. Purity lies in character—not in lack of opportunity. This enviable trait of character in the American woman has been fostered by the freedom which she has always enjoyed. The bicycle is an extenuation of this freedom, and until they get used to it, the new temptations that come with it will find victims.

The practice of picking up acquaintances has not been initiated by the bicycle. It has been common enough on the streets long before the bicycle was known. Sensible girls know very well that nothing good comes from meeting a man in this manner, and sensible girls avoid flirting while wheeling as well as while walking.

The charge has been made that the bicycle engenders a freedom of manners in women, quite in contrast to all accepted ideas of retiring modesty. At summer resorts she is wont to sit around on the hotel porticoes in her bicycle costume, and chew gum and talk slang, etc. While this may be considered by some immodest and

unbecoming, it is, nevertheless, simply another example of the exuberance and good-nature of health. Bicycle women have ceased to be the pale, frail, painted butterflies they used to be, avoiding the sunshine as a pestilence, on account of the damage it would cause their complexions. What if the bicycle girl does sit around in comfortable clothing instead of in a long silk skirt and tight corsets. What if she does chew gum and talk slang as long as she reaps enjoyment from it. There is enough misery in the world.

To sum up the morality of wheeling it may be tersely said that "a lady is a lady wherever she is." To decry wheeling because a few make bad use of it, is to hold the dime of vice so close to the eye that the dollar of virtue cannot be seen beyond.

V.—APPENDIX.

1. HOW TO SELECT A BICYCLE.

With so many bicycle manufacturers in the field, each claiming his production to be superior to all the others, it becomes a difficult matter for even the experienced wheelman to decide which make is the most reliable, the most serviceable, the most perfectly constructed, and the most up to date. The attractiveness of a low price has induced many people to buy a shoddy machine, constructed with the single view "to sell" and sooner or later the buyer awakens to the fact that he is sold. A rotten tire, a weak frame, a loose rattling adjustment, a faulty saddle, are not only uncomfortable—they are unsafe. It is very annoying to start out on an excursion with a party, and after you have gone say ten miles, you are left behind, on account of the collapse of your rotten tire; or to be the object of criticism or ridicule while riding along the boulevard on account of your rattling or squeaking adjustment; or to suffer, perhaps serious injury from a mishapen

saddle. It pays in the end to buy a good reliable wheel, even if you have to pay more for it. The cost of keeping a cheap wheel in repair will eventually pay for the difference in price of a good one.

Whatever make you select, there are several things to consider in the choice of the frame, gearing, etc. Your height, age, weight, sex, strength, and the character of the country over which you intend to ride, whether hilly or level, smooth roads or cow-paths, sand or macadam. It is a ridiculous sight to see a tall man perched on a small-framed wheel, with his saddle and handle bars hoisted way up in order to give his long legs room to play. If you are tall have your frame made large and vice versa.

The gearing is the hardest part of a bicycle to understand, and consequently many mistakes are made in the selection of the gearing. Properly speaking, gearing means the mechanism by which the bicycle is made to move. It consists of two cog wheels, of different sizes, connected by an endless chain. The proportionate sizes of the wheels to each other gives the difference in gearing. Numbers are employed to designate to what height the wheel is geared. For instance, if a wheel is geared to 70 it means that, with one

revolution of the pedals, it will cover as much ground, as an ordinary wheel 70 inches in diameter. Wheels are now geared all the way from 50 to 80. To find the gearing of a bicycle, multiply the diameter of the rear wheel by the number of teeth in the forward sprocket and divide the result by the number of teeth in the rear sprocket. Thus, for example, if the diameter of the rear wheel is 28 in. and the front sprocket has 20 teeth and the rear sprocket 7 teeth, the gear will be 80, i. e. $28 \times 20 \div 7 = 80$.

The gearing makes a good deal of difference in the ease with which a bicycle is propelled. A high gearing requires much more strength than a low one. Especially is this fact made manifest in hill climbing. Yet a high gearing is attractive to many because the pedals do not make as many revolutions in covering a given distance as in a low-geared machine. Ordinary riders, however, should avoid high gearing. The customary gear for men is from 64 to 70 and for women from 59 to 68.

The length of the pedal crank should correspond with the length of the rider's leg. In fact, the three parts of frame, gear and crank should vary with each other, fitting the build of the rider. A tall, long-legged rider should have a large frame

wheel with a high gear (say 70) and a pedal crank of $6\frac{1}{2}$ or 7 inches. A short man should of course have the opposite, a crank of 6 or $6\frac{1}{2}$ inches and a gear of say 64. The cranks in ladies' wheels are usually 6 inches and the gear about 60, but the purchaser should insist on the proper adjustment of the wheel to his or her person.

The saddle is next in importance to the size of the adjustments. A bad saddle may not only be uncomfortable but injurious. In the chapter for women the proper female saddle is fully described. For men the saddle should fit so that it does not press on the soft parts. It should be so well made that it will not sag or warp from the weight, and so cause vicious ridges. In its adjustment it should not be tilted so that the seat slides forward on the narrow pommel. As to the kind of saddle to get, whether softly padded or hard, experience alone will guide you. If you get a soft one at first you will change it for a hard one after you have become proficient in riding, because you will have learned to ride more in your pedals than on your saddle.

A great variety of choice may be had in the shape of handle bars. They are bent in every form from the curved-up U to the ram's horn. The most serviceable kind of handle bar, if you are going to

adopt the inclined position, is one curved downward and backward. This shape permits of a change in position of the hands while riding, by removing them from the cork handles to the center head. The handle bar should not be too wide—the hands, when on the corks, being just outside of the knees. Wooden handle-bars are coming into vogue now. Their superiority has not been proven as yet. They are more springy than the steel ones, and they are said to lessen jarring and consequent numbness of the hands and arms. The adjustment of the handle bar should be such that the cork handles are one-half inch below the level of the saddle.

It is important to have a good tire on your wheel. An otherwise perfect wheel may give you lots of trouble from a rotten tire. The best kind of tire is a single tube. It is more resilient and easier to repair if punctured, than a double tube or any of the patented tires. A large diameter tire is better than a narrow one. It has been proven to be less liable to puncture and is nicer to ride on.

Toe-clips should be on every bicycle and riders should get used to them. Instead of being dangerous, as many suppose, they are of decided assistance both in ascending and descending hills.

The pedals cannot be lost, as when no clips are worn. Of course, one should learn to get out of them quickly when compelled to dismount suddenly. This is effected by a little backward jerk of the foot before raising it from the pedal. Few experienced wheelmen ride without the toe-clips now-a-days.

Brakes are an abomination, and should never be used. If a wheel is fitted with a brake the rider becomes accustomed to it and relies upon it when he ought to use his pedals or perhaps dismount. It is like swimming with a life preserver on: you will never know how to swim until you take it off. Then a brake wears out tires quicker than everything else. It also adds to the weight of the wheel.

A bell, lamp and tool bag are three ⁴⁻⁵important requisites. The law requires you to have the first two, and the uncertain health of the bicycle should induce you to take along the third. Have your bell adjusted within reach of your thumb when your hand is on the corks, and not on the center head. Have your lamp when not lighted covered with a waterproof bag. Get a good lamp, one that throws a good light on the road and stays lit when it is lighted. A popular position for the lamp is on the front fork, close to the hub of the

wheel. The tool bag should contain a wrench, a pump and connection, an oil can and a repair outfit.

A tandem should meet all the requirements of a single wheel. The gearing is especially important because of the possible difference in power of the two riders. A mixed tandem (for man and woman) should have a gear of about 68. A male tandem may be geared as high as 76, but 72 is better for all ordinary riding and for riders unaccustomed to each other.

2. CARE AND MANAGEMENT OF A MACHINE.

The proper care and management of a bicycle is next in importance to the selection of it. Even good wheels get out of order occasionally, and the owner of one will save some expense and trouble by knowing how to take a wheel apart and fix it. In order to do this, a knowledge of the parts and their adjustment is necessary. A close study of a bicycle will impart more knowledge on this subject than pages of written text. To learn how to take a bicycle apart and clean it, however, requires some instruction.

The first thing to learn is the use of the monkey wrench. This tool is always in requisition when

tinkering on a bicycle. It should be carefully fitted, so that each nut is held firmly before power is used to loosen or fasten it. If this is not done, the square nuts will become rounded and thereby useless. When taking a wheel apart, begin systematically laying the nuts and bolts down just as they are taken off, to avoid mixing them. Another precaution is to take off only one part at a time, clean it and readjust it before touching another part. If these rules are not observed, much difficulty in fitting the different parts to their proper places may result.

By far the most delicate and important parts of a wheel's mechanism are its bearings. For this reason great care should be exercised in keeping them in good order. In spite of the many recent improvements calculated to exclude all dust from the bearings, dust will find its way in, and therefore cleaning becomes necessary.

Of course the best way to clean the bearings is to take the wheel apart, wash them and replace them. But everybody cannot take a wheel apart and get it together again correctly, so that a simpler method is necessary. Unless the bearings are very dirty, the following procedure will render them comparatively clean.

Lay the wheel down on two sticks which will

support it, so that the wheels can be revolved, with the sprocket wheel up. Place a shallow pan under the part you are going to clean. By means of a long nozzle oil-can pour kerosene oil into the crank and oil hole of the bearings and revolve the pedal. Keep this up until the oil drips off comparatively clear. Then wipe off all the visible kerosene, and let the wheel stand for some time. Just before using it, be sure and oil all the bearings with a good lubricating oil.

When the bearings are so dirty that it is advisable to dismember the bicycle, be careful to systematically arrange all the removed balls, nuts, bars and bolts, so that they may be correctly returned to their places. Each part should be thoroughly washed in kerosene, dried and polished. In reassembling the parts, if one ball is lost, or the nuts screwed too tight, or left too loose, the perfect mechanism of the wheel is destroyed, and it will run hard, make queer noises and, worst of all, wear down the balls, cones or barrels, so that they become flat or uneven and making repairs impossible.

The frequency of cleaning the bearings depends on the make of the wheel, and upon the use of it—whether it is ridden much or little and over what kind of roads, whether dusty or not. Some

makes of bicycles have their bearings more perfectly fitted than others. Manifestly this kind of wheel will not need as frequent cleaning as one having loose joints. Then if a wheel is ridden every day over dusty roads it will become dirty sooner than one ridden once a week over a clean asphalt street. A good guide to the needed cleaning of the bearings is when the wheel begins to run a little hard, the chain being all right and the adjustment not too tight. In fact, the way to tell whether a wheel is in perfect running order is to suspend it and revolve the wheels. If they revolve easily for a few minutes, gradually getting slower and slower, until finally they swing like a pendulum with the pump connection down, the wheel is all right.

The bearings in the crank box need the most attention ; next to these the hubs and then the pedals. Many bicyclists never touch the pedal bearings at all. It is better not to take them apart ; flushing with kerosene and then liberal oiling ought to be sufficient.

As to oiling, the common mistake is to oil too frequently and profusely. The bearings work better with just sufficient oil to lubricate them than when deluged with it. If too much oil is injected, it will run out and smear the parts and

attract all the dust in the neighborhood. Oiling once a week is a good rule for "ordinary" riding.

The chain is the "bête noir" of the bicycle adjustment to many people. It seems to be constantly out of order. This state of affairs is largely produced by the ignorance or neglect of the wheelman in the care of the chain. Many riders do not take the trouble to clean their chain, but simply smear it with graphite, and expect it to work all right. As a matter of fact, the chain needs more cleaning than any other part of the wheel. Occasionally it should be entirely disjoined and soaked in kerosene. Generally, however, thoroughly wiping it with a soft cloth, then treating it with kerosene while revolving the wheel, is sufficient. After it is clean, properly oiling it should take time and care. Each pin should receive a drop of oil, no more. Then each block, where it meets the tooth of the sprocket, should receive a light smudge of graphite. The rest of the chain should be dry. After thus applying the oil and graphite carefully, revolve the wheels so that they may become well worked in. A chain treated this way looks clean, works well and needs cleaning less often than would otherwise be the case.

The frame of a bicycle should have the dust

wiped off it after every ride. In dry weather this is all the attention it needs. But if mud has collected and dried on it do not attempt to brush off the mud until you have soaked it with a wet sponge. You will thus avoid scratching the enamel and making your wheel look shabby.

The rims should be treated, after a ride, in the same manner as the frame,—cleansed of dust and mud. The spokes should be likewise dusted and rubbed with a soft cloth which has a little vaseline on it. It would be well to have the spokes renickeled once a year, to guard against rust. The rims should be varnished as often if not oftener.

The tires are a very important part of a bicycle. Even if you buy a cheap wheel you should have the very best tires on it. Then you should see that the tires are firmly fastened to the rims. If they are not, the tire will wear out quicker, and besides, it may slip off and give you a bad fall. To keep the tires in good condition it would be well to sponge them after every long ride. Water keeps them from hardening and cracking, and also washes off the dirt thoroughly. This is all the attention your tire will need until you get a puncture. This may not happen once in a season, but it is always well to be prepared for it, when

it does occur, so you should always take a repair kit along with you. The best repair kit on the market is the one containing a lot of little rubber plugs like blunt tacks. To find the puncture is sometimes a difficult matter. The best way is to put a section of the tire under water and if bubbles arise the puncture is in that section. Another way is to smear a film of soap over the suspected point, and soap bubbles will proclaim the hole.

After mending a tire give it time to dry before using it. Then never leave it exposed to the sun, as the cement is liable to melt.

Tires, when in use, should be pumped up hard. When not in use, part of the air should be let out. Contrary to the general opinion, it has been proved that a fully inflated tire will not puncture as easily as a soft tire.

Your lamp, when not in use, should be covered with a bag made for the purpose out of waterproof cloth. If you ride only in daylight, of course you may dispense with carrying your lamp, but it is well to take it along if you start out in the afternoon, for you may be delayed some place, and it is against the law to ride at night without a light. Kerosene is now used in nearly all the best lamps. It gives a better light than other oils, without burning so much oil

and with less smoke. If your lamp smokes without apparent cause, soak the wick in vinegar, dry it and the smoking will cease. Vinegar will also clean the smut which collects on the outside of every lamp. Some bicyclists drop a piece of camphor into the oil in their lamps, believing it makes the flame whiter. This is a bad practice. Camphor, burned, produces the blackest soot and it will smoke your lamp all up. To keep a clear flame, trim the wick frequently.

Always carry your tool bag with its full complement of implements. These should be a wrench, oil-can, screw-driver, pump with connection, and repair kit.

There remains but one thing more to say in regard to caring for a wheel, and that is concerning its storage for the winter. The first thing is to clean it thoroughly, and the second is to protect it in some manner from moisture, dust and air. To clean it thoroughly it is necessary to take it completely apart and go over each part carefully. Then put it together and inflate the tires half full of air. A simple plan to protect it is to make a huge bag out of heavy wrapping paper, sealing all the edges with glue, and put the wheel within it. Seal the opening, and you have a covering that is moisture and dust proof.

RELATIVE VALUE OF FOOD STUFFS.

ARTICLES.	As Mate- rials for Muscle Making.	As Heat Givers.	As Food for Brain.	WATER.	Time Re- quired to Digest.
FRUITS.	PER CENT.	PER CENT.	PER CENT.	PER CENT.	H. M.
Apples.....	0.9	10.1	0.8	88.5	2.80
Cherries.....	0.6	21.0	1.0	78.8	2.00
Currants.....	0.9	6.8	0.8	81.3	8.00
Dates.....	0.0	78.7	0.0	24.0	8.15
Figs.....	5.0	57.9	8.4	18.7	8.80
Pears.....	0.1	9.6	0.0	86.4	1.80
Prunes.....	3.9	78.6	4.5	13.0	2.50
Peaches.....	1.0	5.4	0.2	85.6	2.80
FISH.					
Codfish.....	16.5	1.0	2.5	80.0	2.00
Clams.....	12.0	0.5	3.0	85.0	2.45
Eels.....	17.0	0.5	4.0	75.0	3.50
Herring.....	18.0	0.5	5.0	75.0	3.50
Halibut.....	18.0	0.5	4.0	74.0	2.45
Lobsters.....	14.0	0.5	6.0	79.0	4.00
Oysters.....	12.6	0.5	0.2	87.2	2.80
Salmon.....	20.0	0.5	7.0	74.0	3.80
Smelts.....	17.0	0.5	6.0	75.0	3.15
Trout.....	16.9	0.8	4.8	78.0	2.45
GRAINS.					
Barley.....	12.8	52.1	4.2	14.0	2.00
Buckwheat.....	8.6	58.0	1.8	14.2	2.15
Corn.....	12.8	67.5	1.1	14.0	3.15
Oats.....	17.0	50.8	3.0	13.6	3.00
Rye.....	6.5	75.2	0.5	13.5	2.00
Wheat.....	14.6	66.4	1.6	14.0	1.80
MEATS.					
Beef.....	19.0	14.0	2.0	65.0	3.80
Bacon.....	8.4	62.5	0.5	28.6	4.00
Chicken.....	21.6	1.9	2.8	29.7	3.45
Ham.....	35.0	82.0	4.4	28.6	4.00
Kidney.....	21.2	0.9	1.4	76.5	3.50
Liver.....	26.3	3.9	1.2	68.6	3.50
Lard.....	0.0	100.0	0.0	0.0	3.45
Lamb.....	19.6	14.3	2.2	63.9	3.80
Mutton.....	21.0	14.0	2.0	63.0	3.40
Pork.....	17.5	16.0	2.2	64.8	4.00
Pigeon.....	23.0	1.9	2.7	72.4	3.45